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## An economics study on growth rate of cashew nut in Bastar district of Chhattisgarh state

**Kanchan Chiram, Dr. Hulas Pathak and Dronak Kumar**

### Abstract

The present study deals with analysis of cashew nuts marketing channels in Bastar district of Chhattisgarh state. The Bastar area of Chhattisgarh is purposely selected for this study because this area has different levels of the cost of production and returns of cashew nut in the Chhattisgarh state. The primary data were collected for the year 2019-2020. Primary data were collected from the sample respondents by conducting personal interview and pretested schedule. 80 farmers were selected randomly from Bastar district of Chhattisgarh. The overall cropping intensity was found to be nearly 148.16 percent. Also the cropping intensity among the farms under overall, marginal, small, medium, large farmer was 139.74, 155.78, 147.04 and 155.74 percent, respectively. The growth in area, production and productivity of cashew nut of the Chhattisgarh state and Bastar district was significant and found to be 5.07, 10.35 and 5.03 per cent, 1.69, 11.14 and 9.29 per cent, respectively. A suggestion was information about high-yielding varieties of cashew should be given to the farmers with technological support from KVK. Farmers should be given information about sowing intercropping crops in cashew fields through rural agricultural extension officer for additional income.

**Keywords:** compound growth rate, significant, simple random sampling

### Introduction

Cashew nut is a highly nutritious product. It gives more calories to the human body. Because of its nutritious content it gives more strength and stamina to the body. The cashew nut producers take a little percentage for their consumption and sell the remaining percentage. The outer surface of the nut which is bought by the hotels and industries is used as fire wood. The inner nut is marketed and used by the bakeries for preparing various types of sweets and it is used for some other tasty consumable products as well. The broken inner nut is used for local consumption (Bhat Venkataram 2019).

In Chhattisgarh, it is being cultivated in Bastar, Dantewada, Kanker, Raigarh, Sarguja and Jashpur district occupying an area of 8000 ha with a production of 3.0 thousand metric tons and productivity of 460 kg/ha (raw nut) in spite of this about 40 thousand hectare non-traditional area can be brought under Cashew cultivation [Nag S.K. 2016]. Cashew nut is a tropical tree crop of much importance. Looking to the economic importance of Cashew nut in the state has been undertaken [Saroj, P.L. 2015]. Therefore, there is a possibility of locating high yielding types and other diverse types suitable for growing in waste degraded lands. There are ample opportunities to develop the Cashew in the state by eliminating the socio-economic gaps of Cashew grower's farmers of the state [Malhotra S.K., 2015].

Chhattisgarh has a large wasteland area suitable for cashew cultivation mostly in the districts of Bastar and Raigarh. Cashew plantation was started in Bastar around the 1960s. The majority of the cashew plantations raised by the Forest Department and Chhattisgarh Horticulture Department were of seedling origin. Some of the plantations are as old as 20-30 years. Therefore, there is a possibility of locating high yielding types and other diverse types suitable for growing in waste degraded lands. In this regard from 68 cashew genotypes including 18 promising local germplasms maintained by our research station, the promising entry CARS-10 has been identified as 'Indira Kaju-1' by the State Seed Sub-Committee, Govt. of Chhattisgarh in the year 2010; besides, NRC-137 and locally collected germplasm (CARS-17) was found promising with yield of 8.80 and 13.5 kg/tree, respectively. The objective of the study was to compound growth rate of area, production and productivity of cashew nut in Bastar district and Chhattisgarh state.

## Materials and Methods

### Collection of data

The study is based on both primary and secondary data. The primary data was collected from the selected respondents with the help of pre-tested interview schedule by the personal interview method and secondary data was collected from Chhattisgarh agriculture statistics, land record office, annual districts statistics and other published and unpublished reports.

### Methodology

80 farmers were selected randomly from Bastar district farming area and market. A multistage simple random sampling technique (SRS) was adopted to select the block, villages and the respondents, market and different farmer involved in cashew nut production and marketing in Bastar farming area. The details of the sampling techniques at various stages are given as under:

### Compound Growth Rate (CGR)

To analyze the pattern of growth in area, production and productivity of cashew nut in study area, Compound Growth Rate (CGR) was computed. The details of the formulae given as under:

$$Y = a b^t$$

Where,

Y = Area / Production / Productivity

t = Time variable

b = Regression coefficient

a = Intercept.

The average annual compound growth rates 'r' was computed by using the following formula.

$$CGR (r) = [\text{Antilog} (\log b) - 1] \times 100$$

Where,

r = Compound growth rate.

Significance of growth rate was judged by student's "t" test.

## Results and Discussion

### General characteristics of sample households

#### Demographical features of sampled households

Demographical features of sampled households in study area considerably influence various economic activities like resource allocation, resource use efficiency, production pattern, distribution pattern and exchange of final product which is directly related with economy of farmers. Thus, the social beliefs, traditions and taboos influence the techniques of production particularly the use of improved technology in the production process. The social factors such as the size of family, literacy, sex-ratio, social disparities, socio-economic status, caste rigidities, social mobility etc, either retard or promote the process of economic growth by influencing the efficiency in production process.

It is essential to understand the detailed insight picture of sampled households under the demographical features which is presented in Table 1. It reveals that 80 numbers of sampled households comprised of marginal, small, medium and large farmers of 25, 25, 15 and 15 numbers, respectively. The average family members varied from 4.93 to 5.8 across the farm size.

**Table 1:** Demographical features of sampled households

S. No	Particulars	Marginal	Small	Medium	Large	Total
<b>A</b>	<b>No. of sample households</b>	<b>25</b>	<b>25</b>	<b>15</b>	<b>15</b>	<b>80</b>
	No. of family member	145	137	78	74	434
	Male	80	75	42	40	237
		(55.17)	(54.74)	(53.85)	(54.05)	(54.61)
	Female	65	62	36	34	197
		(44.83)	(45.26)	(46.15)	(45.95)	(45.39)
	Average family size	5.8	5.48	5.2	4.93	5.43
<b>B</b>	<b>Distribution of sampled households by social status</b>					
	a) Schedule tribe	10	9	5	4	28
		(40.00)	(36.00)	(33.33)	(26.67)	(35.00)
	b) Schedule cast	3	4	2	2	11
		(12.00)	(16.00)	(13.33)	(13.33)	(13.75)
	c) Other backward caste	10	8	4	4	26
		(40.00)	(32.00)	(26.67)	(26.67)	(32.50)
	d) Others	2	4	4	5	15
		(8.00)	(16.00)	(26.67)	(33.33)	(18.75)
	<b>Total</b>	<b>25</b>	<b>25</b>	<b>15</b>	<b>15</b>	<b>80</b>
<b>C</b>	<b>Distribution of family members by age of sampled households</b>					
	a) Up to 18 years	47	41	27	25	140
		(32.41)	(29.93)	(34.62)	(33.78)	(32.26)
	b) 18-60	65	69	39	38	211
		(44.83)	(50.36)	(50.00)	(51.35)	(48.62)
	c) Above 60 years	33	28	12	11	84
		(22.76)	(20.44)	(15.38)	(14.86)	(19.35)
	<b>Total</b>	<b>145</b>	<b>138</b>	<b>78</b>	<b>74</b>	<b>435</b>
<b>D</b>	<b>Distribution of family members by education level of sampled households</b>					
	a) Illiterate	20	15	4	4	43
		(13.79)	(10.95)	(5.13)	(5.41)	(9.91)
	b) Primary	15	13	12	10	50
		(10.34)	(9.49)	(15.38)	(13.51)	(11.52)
	c) Middle	61	55	19	15	150

	(42.07)	(40.15)	(24.36)	(20.27)	(34.56)
d) High school & higher secondary	36	39	30	31	136
	(24.83)	(28.47)	(38.46)	(41.89)	(31.34)
e) Above Higher secondary	13	15	13	14	55
	(8.97)	(10.95)	(16.67)	(18.92)	(12.67)
Literacy	86.21	89.05	94.87	94.59	90.09

Note: Figure in parentheses is indicating the percentage of total number of family members.

Overall, family composition in proportion of male and female was 54.61 and 45.39 percent. The caste wise composition of sampled households was noticed the maximum of Schedule tribe (ST) and found to be (35.00 %) followed by other backward caste (OBC) (32.50 %), others (18.75 %) and schedule caste (ST) (13.75 %), respectively. The age of family members are important to understand the working force and categorized into upto 18 years old, 18 -60 years old and above 60 years old.

It was found that age of youth as working force between age of 18 to 60 years was in majority of (38.62 %) followed by above upto 18 years old (32.26%), and 60 years old (19.35 %) respectively (figure 1). The literacy, irrespective to the level of education was quite high and found to be 90.09 percent. Among them level of education between middle school examinations passed was in majority and noticed to be 34.36 percent (figure 2).

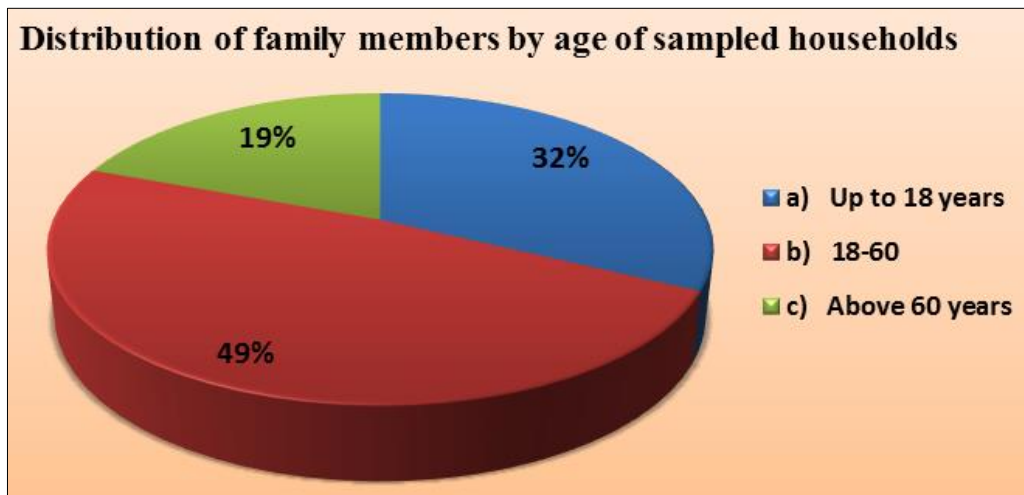


Fig 1: Distribution of family members by age of sampled households

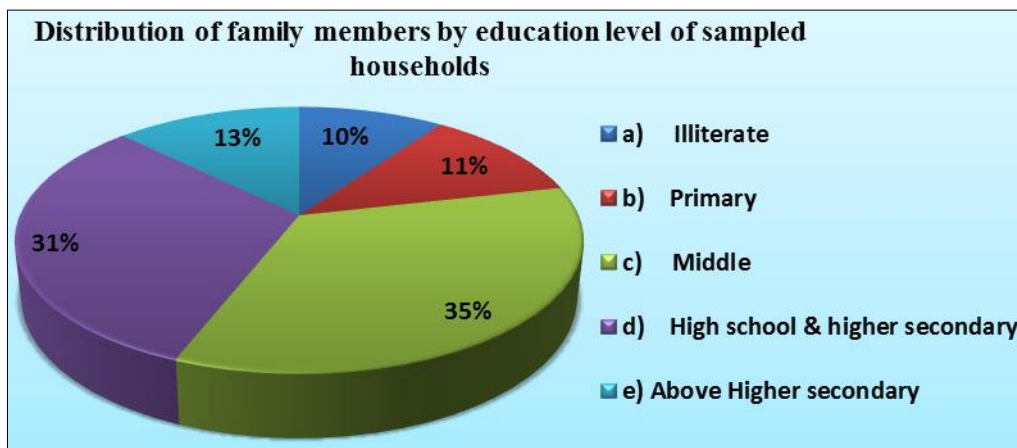


Fig 2: Distribution of family members by education level of sampled households

**Operated area at sample farms**

The operated area is estimated by owned area plus leased in and subtracted the leased out area of sample farms at the same in presented in table 2. It reveals that the overall farm size of sample farms was 2.11 hectares with 0.86, 1.59, 2.68 and 6.24 hectares for marginal, small, medium and large farms, respectively. The operated area was found to be overall 1.97

hectares with 0.78, 1.47, 2.53 and 5.92 hectares under respective farms under study. The area under irrigation was observed 44.67 percent and remaining area (55.32 percent) was observed un-irrigated in the district. Out of the total cropped area occupied the maximum area under large farms 94.87 per cent followed by medium farms 94.40, small farms 92.45 and marginal farms 90.70, respectively.

**Table 2:** Average cropped and operated area of sample households (ha./farm)

S. No.	Particular	Farm size				
		Marginal	Small	Medium	Large	Overall
1	Owned land	0.86	1.59	2.68	6.24	2.11
2	Land for agriculture use	0.78	1.47	2.53	5.92	1.97
		(90.70)	(92.45)	(94.40)	(94.87)	(93.47)
3	Land for non-agriculture use	0.07	0.11	0.15	0.32	0.13
		(9.30)	(7.55)	(5.60)	(5.13)	(6.16)
4	Irrigated area	0.31	0.61	0.94	3.12	0.88
		(39.74)	(41.50)	(37.15)	(52.70)	(44.67)
5	Un-irrigated area	0.47	0.86	1.59	2.80	1.09
		(60.26)	(58.50)	(62.85)	(47.30)	(55.32)

**Note:** Figures in parentheses indicate percentages in braced.

**Irrigated area by different sources**

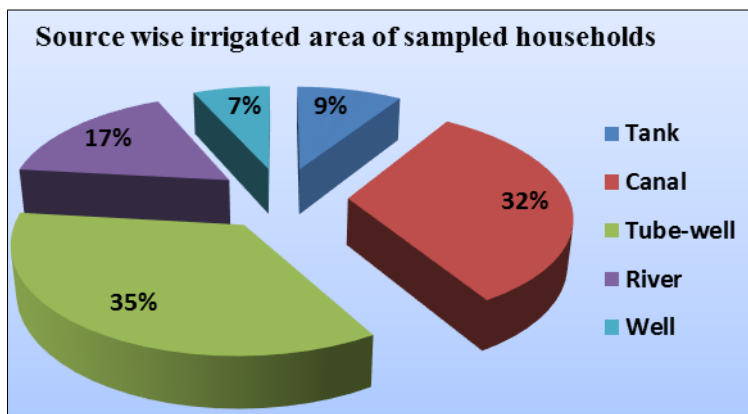
Table 3 (Figure 3) reveals that tube-well was the main source of irrigation and shared 35.27 percent irrigation. While canal source of irrigation (32.40 percent), tank (9.10 percent), river (0.15 percent), and well (0.06 percent) respectively. Looking

to the forest ecology of the study area, measure to conserve water resources in the form of situation-specific rainwater harvesting structures should be created to strengthen the water resources in the region.

**Table 3:** Source wise irrigated area of sampled households (ha/farm)

S. No.	Particular	Farm size of holdings				
		Marginal	Small	Medium	Large	Overall
1	Tank	0.02	0.05	0.13	0.38	0.10
		(6.45)	(8.20)	(13.83)	(12.18)	(9.10)
2	Canal	0.14	0.21	0.18	0.29	0.19
		(45.16)	(34.43)	(19.15)	(9.29)	(32.40)
3	Tube-well	0.1	0.18	0.34	1.78	0.38
		(32.26)	(29.51)	(36.17)	(57.05)	(35.27)
4	River	0.03	0.13	0.22	0.47	0.15
		(9.68)	(21.31)	(23.40)	(15.06)	(16.56)
5	Well	0.02	0.04	0.07	0.2	0.06
		(6.45)	(6.56)	(7.45)	(6.41)	(6.67)
	Total irrigated area	0.31	0.61	0.94	3.12	0.88
		(100.00)	(100.00)	(100.00)	(100.00)	(100.00)

**Note:** Figures in parentheses indicate percentages in braced.



**Fig 3:** Source wise irrigated area of sampled households.

**The compound growth rate of area, production and productivity of cashew nut in Bastar district and Chhattisgarh state**

The time series cross sectional secondary data from 2010-11 to 2019-20 was used to examine the growth in area, production and productivity of cashew nut of Bastar and Chhattisgarh State as a whole, sampled districts of study area of Chhattisgarh, which is shown in Table 4. The results showed that growth in production of cashew nut of the

Chhattisgarh state was significant and found to be 10.35 per cent growth in production which attributed with significant increase in area and productivity of cashew nut by per cent was 5.07 and 5.03 per cent was found in Chhattisgarh state.

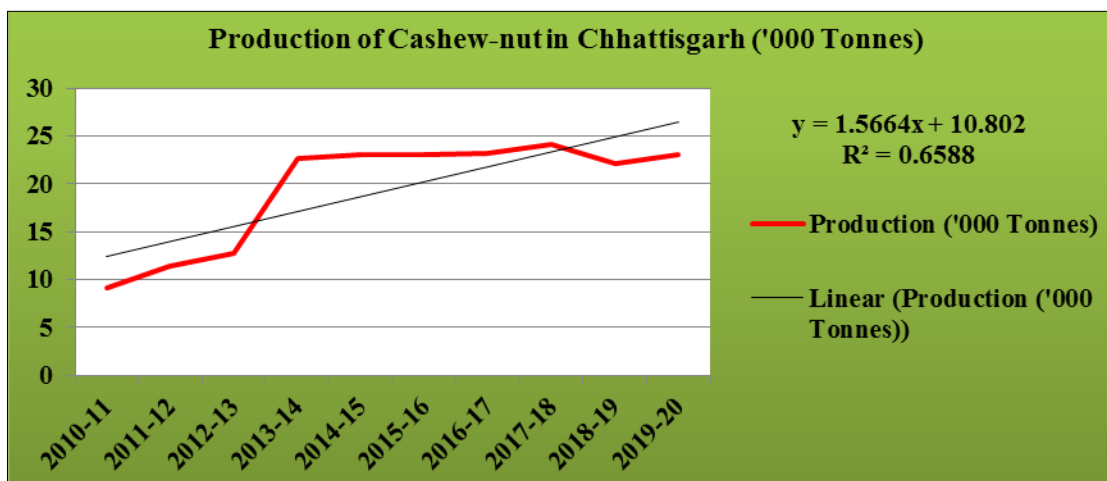
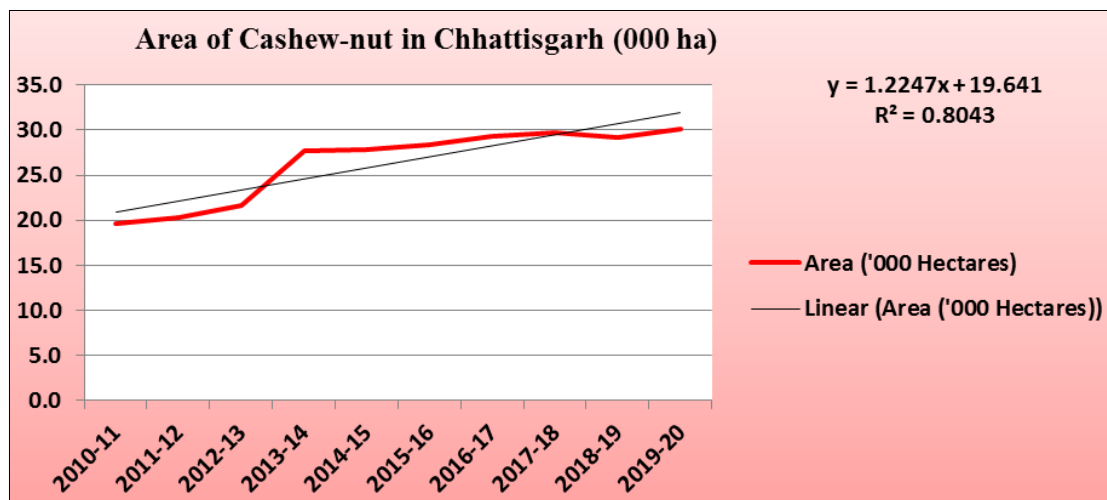
The growth in production of cashew nut of the Bastar district was significant and found to be 11.14 per cent growth in production which attributed with significant increase in area and productivity of cashew nut by per cent was 1.69 and 9.29 per cent was found in Bastar district.

**Table 4:** Compound growth rate of area, production and productivity of Cashew-nut in Bastar District in Chhattisgarh state

S. No.	Year	Area ('000 Hectares)	Production ('000 Tonnes)	Productivity (Tonnes/ha)
1	2010-11	7.4	3.182	0.43
2	2011-12	7.7	3.31	0.43
3	2012-13	6.83	2.936	0.43
4	2013-14	7.125	3.562	0.50
5	2014-15	7.56	6.048	0.80
6	2015-16	7.56	6.048	0.80
7	2016-17	7.77	6.216	0.80
8	2017-18	8.159	6.589	0.81
9	2018-19	8.241	6.655	0.81
10	2019-20	8.405	6.79	0.81
$\bar{X}$		9.25	7.40	0.66
Absolute change		0.96	3.54	0.38
Relative change (%)		13.11	112.49	87.87
SD		0.52	1.59	0.18
CV		5.58	21.50	26.69
<b>CGR Bastar District</b>		1.69*	11.14*	9.29*
<b>CGR Chhattisgarh state</b>		5.07*	10.35*	5.03*

Sources: Directorate of Agriculture Chhattisgarh (2019-20)

Note: \* Significant 5% level probability



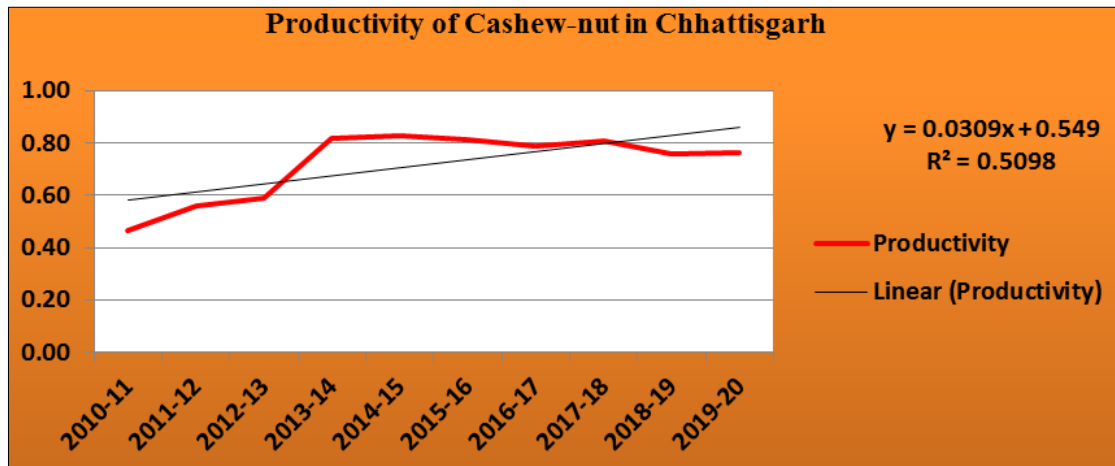
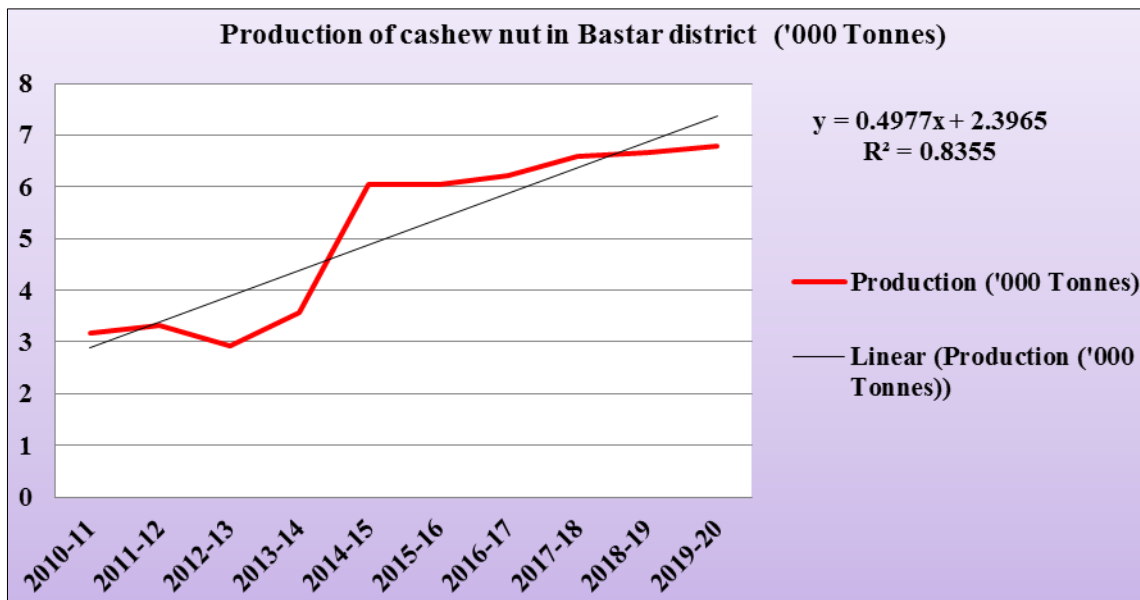
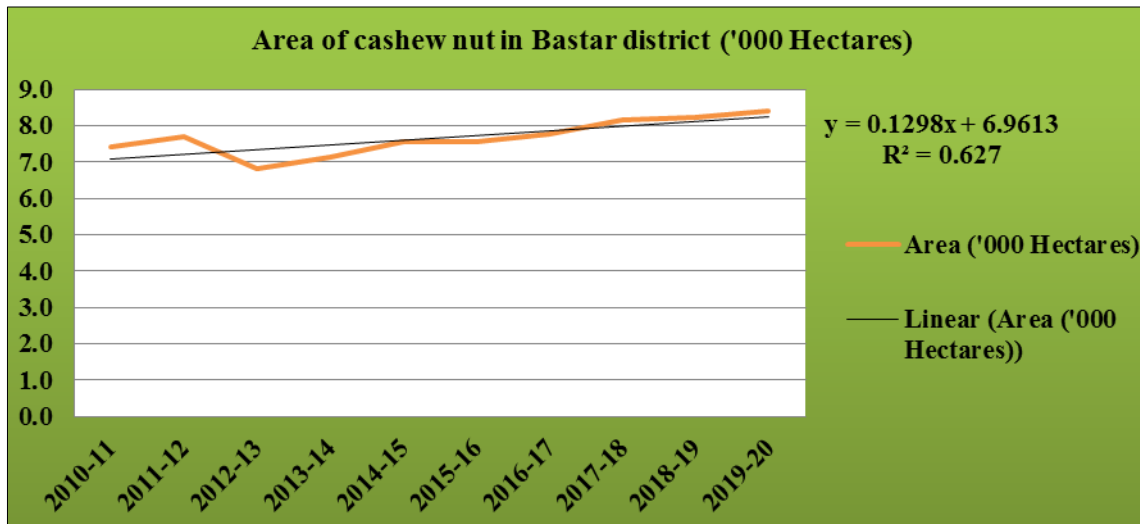


Fig 4: Trend in area, production and productivity of cashew nut in Chhattisgarh





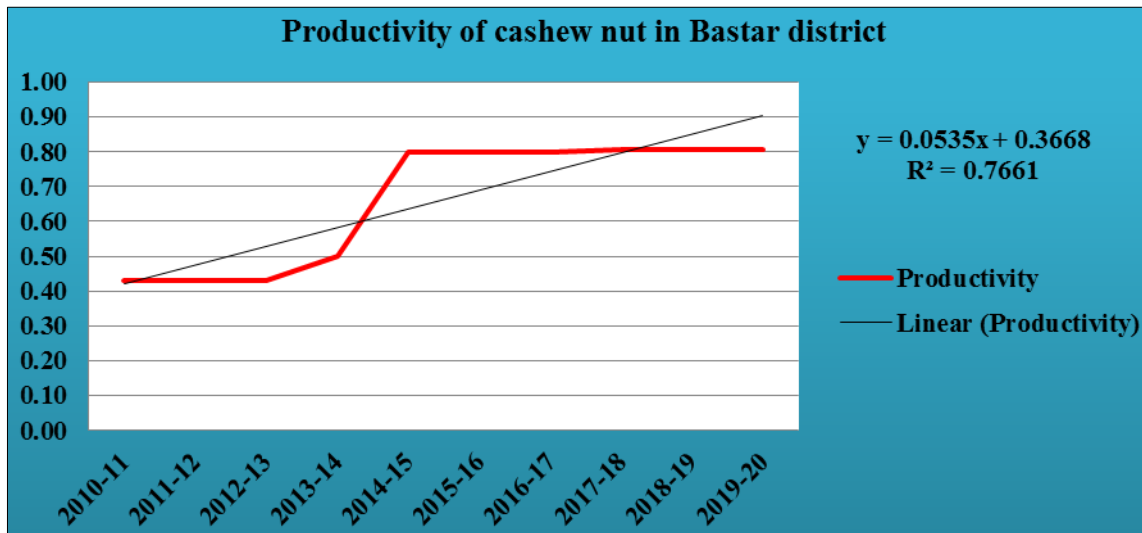


Fig 5: Trend in area, production and productivity of cashew nut in Bastar district

### Suggestion

Information about high-yielding varieties of cashew should be given to the farmers with technological support from KVK. Farmers should be given information about sowing intercropping crops in cashew fields through rural agricultural extension officer for additional income, Cooperative societies should be formed more and more for the marketing of cashew nuts. Cashew processing industry should also be established for the promotion of cashew nut cultivation area and production.

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